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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/624,313

07/22/2003

Sujatha Ramanujan

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09/24/2004

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EXAMINER

PHAM, HAI CHI

ART UNIT

PAPER NUMBER

2861

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/624,313	Applicant(s) RAMANUJAN ET AL.	
	Examiner Hai C Pham	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-102 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-102 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07/22/03</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. The following claims are objected to because of the following informalities:

Claim 1:

- Line 15, “a spatial light modulator” should read --said spatial light modulator-- since it is previously recited within the claim.

Claim 36:

- Claim 36 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 36 recites the following limitation “a beamsplitter”, which has been already recited in the parent claim 1.

Claim 54:

- Line 17, “a spatial light modulator” should read --said spatial light modulator--.

Claim 66:

- Line 15, “a spatial light modulator” should read --said spatial light modulator--.
- Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. The following claims are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16:

- The following claimed element “a multi-element controller” is vague in that it is not known if the controller is being claimed as controlling a plurality of components in the printing apparatus and which elements are being controlled.

Claim 37:

- Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the location of the claimed “pellicule” relative to the remaining components of the printing apparatus is not known.

Claim 38:

- Claim 38 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections: the location of the claimed “turning mirror” relative to the remaining components of the printing apparatus is not known.

Claim 39:

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- Claim 39 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections: the location of the claimed “prism” relative to the remaining components of the printing apparatus is not known.

Claim 52:

- “said media supply” lacks clear antecedent basis.

Claim 57:

- The following claimed element “a multi-element controller” is vague in that it is not known if the controller is being claimed as controlling a plurality of components in the printing apparatus and which elements are being controlled.

Claim 69:

- The following claimed element “a multi-element controller” is vague in that it is not known if the controller is being claimed as controlling a plurality of components in the printing apparatus and which elements are being controlled.

Claim 83:

- The following limitation “allowing residual images to decat is not understood.

Claim 90:

- “said width dimension” lacks clear antecedent basis.

Appropriate correction is required.

Duplicate Claims

4. Claims 49 and 94 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 48 and 93, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Double Patenting

5. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

6. Claims 92-102 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 44-46, 108-114 of prior U.S. Patent No. 6,580,490. This is a double patenting rejection.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 6, 9-12, 14-36, 38-44, 47-51, 78-82, 84-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. (U.S. 6,215,547) in view of Kataoka et al. (Pub. No. U.S. 2003/0085987).

Ramanujan et al., an acknowledged prior art, discloses a reflective liquid crystal modulator based printing system, which comprises all the claimed elements a control logic processor capable of controlling the operation of said apparatus for printing based on said digital image data (inherent to the printing system for conducting the normal printing operation), an image forming assembly (Fig. 1a) for directing onto said light sensitive medium (160) disposed at said image plane (150), an exposure beam for printing, said image forming assembly comprising a light source (30) for providing light exposure energy for imaging onto said light sensitive medium, a first lens assembly (11) for directing said light exposure energy to a spatial light modulator (52), a beamsplitter (50), which directs said light exposure energy to said spatial light modulator, said spatial light modulator having a plurality of individual elements capable of altering a polarization state of said light exposure energy to provide an exposure beam for printing, a state of each of said elements controlled by said control logic processor according to said digital image data (col. 3, line 61 to col. 4, line 7), a second lens assembly (132) for directing said exposure beam onto said light sensitive medium.

However, Ramanujan et al. fails to teach the temperature profile control apparatus for controlling a temperature profile of said spatial light modulator, a heat

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sink, a thermo-electric cooler, a multi-element controller, a localized environmental controller, a uniform temperature profile.

Kataoka et al. discloses an image recording apparatus comprising a modulator (12) provided with a cooling system (42) and a heat spreader (421) for controlling the temperature of the modulator to ensure its stability and lifetime, the cooling system further including a fan (51) for controlling the environment temperature, and simultaneously controlling various components in the optical head (10) of the printing system such as the light source, the mirrors... Kataoka et al. further suggests a variety of cooling devices such as thermo-electric cooler or peltier devices.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the spatial light modulator of Ramanujan et al. with the cooling system as taught by Kataoka et al. The motivation for doing so would have been to ensure its stability and lifetime as suggested by Kataoka et al.

Ramanujan et al. further teaches all the claimed elements as recited in claims 2-3, 6, 9-12, 20-36, 38-44, 47-51 (see Figs. 1 and 9).

The method claims 78-89 and 91 are deemed to be clearly anticipated by functions of the above structures.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Kataoka et al., as applied to claim 1 above, and further in view of Haven et al. (U.S. 6,739,723).

Ramanujan et al., as modified by Kataoka et al., discloses all the basic limitations of the claimed invention except for the polarizer being a wire grid.

Haven et al. discloses a projection display system wherein the light beam is polarized using a polarizer in the form of a wire grid (117), which is known to provide a polarized light with improved uniformity and brightness.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use a wire grid as the polarizer in the device of Ramanujan et al. as taught by Haven et al. The motivation for doing so would have been to provide a high quality of polarized light output with improved uniformity and brightness as suggested by Haven et al.

10. Claims 5 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Kataoka et al., as applied to claim 1 above, and further in view of Okazaki (U.S. 4,978,970).

Ramanujan et al., as modified by Kataoka et al., discloses all the basic limitations of the claimed invention except for the polarizer being a pellicle.

However, it is well known in the art of light beam synthesizing that a beamsplitter, a pellicle beamsplitter or a half mirror can variably be used to reflect a light beam of certain polarization type while letting a light beam of another polarization type to pass through. Okazaki, for example, discloses an optical scanning device, which comprises polarizing beamsplitters (3 and 10) for splitting and recombining the polarized laser

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beams before exposing the surface of the photosensitive drum (25), where any types of a beamsplitter can be used, namely half mirror, pellicle beamsplitter.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Ramanujan et al. with the aforementioned teaching of Okazaki for the purpose of providing an alternative polarized beamsplitter that best fits the application.

11. Claims 7-8, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Kataoka et al., as applied to claim 1 above, and further in view of Pasch (U.S. 5,055,871).

Ramanujan et al., as modified by Kataoka et al., discloses all the basic limitations of the claimed invention except for the uniformizer being a fiber.

Pasch discloses an apparatus for enhancing illumination uniformity in a lithographic device by using uniformizer such as fly-eye lenses, light pipe or fiber optic bundles.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a fiber optic bundles as uniformizer in the device of Ramanujan et al. as taught by Pasch. The motivation for doing so would have been to provide enhanced illumination uniformity.

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12. Claims 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Kataoka et al., as applied to claim 1 above, and further in view of Besinger et al. (U.S. 5,502,532).

Ramanujan et al., as modified by Kataoka et al., discloses all the basic limitations of the claimed invention except for using a chemical bath or heat for developing the photosensitive medium.

However, the method and apparatus for heat-developed or chemically-developed photographic film is well known in the art as evidenced by Besinger et al.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the chemical or heat developer in the device of Ramanujan et al. since Besinger et al. teaches this to be known in the art for developing photographic film.

13. Claims 52-53 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Kataoka et al., as applied to claim 1 above, and further in view of Hisaaki (U.S. 5,438,345).

Ramanujan et al., as modified by Kataoka et al., discloses all the basic limitations of the claimed invention except for recording medium supply and the sensor for sensing the width of the supplied recording medium.

However, Hisaaki discloses an image forming apparatus provided with a paper supply cassette (52) for supplying the recording medium (P) and a manual feeding tray (53) for supplying recording medium of different types and sizes, wherein the apparatus

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is also provided with various sensors for sensing the availability as well as the type and size of recording medium such that the output level of the light source in the optical head can be automatically adjusted based on the information provided by the sensors.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide recording medium supply and the medium-size sensing device to the device of Ramanujan et al. as taught by Hisaaki. The motivation for doing so would have been to automatically adjust the output level of the exposure light based on the supplied recording medium.

14. Claims 54-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Cubalchini (U.S. 3,858,046).

Ramanujan et al. discloses all the basic limitations of the claimed invention except for the temperature profile apparatus for controlling a temperature profile of the beamsplitter.

Cubalchini discloses a beamsplitter system (10) provided with a cooling member (50) for conveying away any heat that the beamsplitter may have absorbed from the laser beam (41), the cooling member can be any convenient heat exchanger.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the beamsplitter of Ramanujan et al. with the cooling member as taught by Cubalchini. The motivation for doing so would have been to ensure its stability and lifetime.

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15. Claims 66-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanujan et al. in view of Daimon et al. (Pub. No. U.S. 2003/0091924).

Ramanujan et al. discloses all the basic limitations of the claimed invention except for the temperature profile apparatus for controlling a temperature profile of the light sensitive medium.

Daimon et al. discloses an image forming method and apparatus including a cooling device (6) being provided to the recording medium (9) to promote images with excellent surface smoothness.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the recording medium in the device of Ramanujan et al. with the cooling device as taught by Daimon et al. The motivation for doing so would have been to promote produced images with excellent surface smoothness.

Pertinent Prior Art

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hewlett (U.S. 5,940,204) discloses a digital micro-mirror device provided with a cooling system.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

September 17, 2004